ProB V1.0.6

Installation Manual

Document Version 0.2

(generated June 29, 2004)

http://www.ecs.soton.ac.uk/~mal/systems/prob.html

University of Southampton, UK
Declarative Systems and Software Engineering

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1 Installing ProB

Thank you for your interest in ProB.

Please ensure that you are using the correct edition of the installation instructions appropriate to your needs and expertise:

Installation instructions are available in a range of levels of detail. This is not a mistake: some people only require one page, others quite a few more. If you cannot follow the instructions or have problems installing we suggest you look to the installation documentation with the next highest level of detail. (See edition list below.)

If you are having problems installing third party software for use with ProB, in the first instance please see the FAQs that accompany the 'Complete OS' and 'Verbose' editions of the installation instructions below. If your problem is not addressed in these editions, please see the *Trouble Shooting* chapter in the *User Manual*. You may also like to consult the instructions that came with the software causing difficulty. Requests for help may also be sent to the ProB mail list.

If you are unfamiliar with installing software or fixing problems that may occur when installing third party software, it isn't a good idea to work your way through the different versions of the installation instructions starting with Ultra brief and working up: stick to the most detailed (it will be quicker in the end).

All versions of the installation instructions are available from the ProB homepage (`http://www.ecs.soton.ac.uk/~mal/systems/prob/`).

Available Editions:

0.5 page *Ultra quick instructions*: See the "Quick Install Instructions" at `http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/INSTALL.html`. A copy of these instructions is included in the appendices of the *User Manual* in the section *Ultra Quick Instructions*.

1 pages *Brief instructions*: slightly more detail. For latest see "Full" installation instructions at `http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/INSTALL.html`. A copy of these instructions is included in the appendices of the *User Manual* in the section *Brief Installation Instructions*

9 pages *Detailed instructions for* ProB *only*: detailed information only about installing ProB (not other pieces of third party software used by ProB). Includes instructions for Linux (non RPM), Solaris, Mac OSX, and Windows with screen shots where necessary. Available as PostScript, Adobe Acrobat and HTML.

15 pages *Complete OS edition*: Includes detailed installation instructions with screen shots for installing ProB as well as our guides to how to install other third party software (e.g. GraphViz, TclTk, Java) for use by ProB. Separate editions are available for Linux, Mac OSX, Solaris and Windows. Available as PostScript, Adobe Acrobat and HTML.

44 pages *Obscenely verbose edition*: Includes detailed install guide with screen shots for installing ProB as well as other software that ma y be used by ProB. Provides instructions for all editions of ProB and our instructions for additional third party software used by ProB for Solaris AND Linux (RPM and otherwise) AND Windows AND Mac OSX. Available as PostScript, Adobe Acrobat and HTML.

1.1 ProB Licence

The latest version of this information can be obtained via About→About ProB

```
Version 1.0.6
Released on June 16 2004

ProB: A B-animator and model checker
------------------------------------

(C) 2000-2004 Michael Leuschel, DSSE, University of Southampton
All rights reserved.
Free for non-commercial, academic use or evaluation purposes.
For commercial use, contact the author (http://www.ecs.soton.ac.uk/~mal).


ProB comes with ABSOLUTELY NO WARRANTY OF ANY KIND !
This software is distributed in the hope that it will be useful
but WITHOUT ANY WARRANTY. The author(s) do not accept responsibility
to anyone for the consequences of using it or for whether it serves
any particular purpose or works at all. No warranty is made about
the software or its performance.


For updates and news check:
  http://www.ecs.soton.ac.uk/~mal/systems/prob.html
  http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/Updates/

ProB uses state-of-the-art Prolog technology (co-routining, finite
domain constraint solvers, PILLOW XML package,...) to achieve symbolic debugging,
constraint-based and temporal-logic based model checking.
The tool is partly being developed within the EPSRC grants iMoc and ABCD.

Development, Copyright and Intellectual Property Rights:
B-Kernel & Model Checker:
Michael Leuschel
TCL/TK Interface:
Michael Leuschel, Laksono Adhianto
"XML to Prolog" Parser, Compiler & Further Extensions:
Michael Butler, Carla Ferreira,
Michael Leuschel, Stephane Lo-Presti, Leonid Mikhailov,
Ed Turner, Phil Turner

Open Source "B to XML" Java Parser + Type Checker:
    Bruno Tatibouet
    (see http://lifc.univ-fcomte.fr/~tatibouet/JBTOOLS/ for more details)

Known limitations:
==================

Many:
 - Unsupported features: complex definitions, some operators, WHILE loops...
    (see included machines for which features are actually supported)
 - not yet optimised for speed using partial evaluation
 - recursive set comprehension  ( ss = {xx |  ... xx: ss ...}) may not always work properly


To visualize state space,...: dot from AT&T's GraphViz package has to be installed

See the FAQ.txt file for troubleshooting and frequently asked questions.
```

1.2 Installation Requirements

This manual is concerned with the TclTk version of ProB. The prototype/alpha Java GUI version has no accompanying documentation at this time.

Please do not attempt to install ProB before ensuring you have a valid and correctly installed version of Tcl/Tk:

Windows	Version 8.3
Mac OS X	Version 8.4
Solaris	Version 8.4
Linux	Version 8.3 or 8.4 (preferred)

To get the most benefit from ProB, we *strongly* recommend that you install GraphViz and Java if they are not already installed:

Feature	*Requires*
Modification of sample machines and/or authoring of new machines	Java (Run-time or SDK)
Visualisation of State Spaces (current state, visited, shortest-path to current state)	GraphViz

Source URLs and installation instructions for TclTk, Java and GraphViz may be found in the *Verbose* edition of the installation instructions referred to below.

1.2.1 Frequently Asked Questions

- How do I get assistance with problems with ProB?
  - Non-members of Southampton University
    Please send you comments, suggestions or problems to the ProB mailing list. You can subscribe by sending an email with `subscribe prob-users` in the body to `majordomo@ecs.soton.ac.uk`.
  - Members of Southampton University
    If you are a member of Southampton University you should use the problem tracker located at https://secure.ecs.soton.ac.uk/cgi-bin/jbug/systems/ProB

    Unresolved problems remain active on the problem tracker. Please do not submit a request for help or report problems that already occur on the list. The student edition of the documentation will be updated regularly, so please also check the on-line version before submitting requests for help. If you find a problem with *ProB* (as opposed to third party software) please let us know as soon as possible. We are happy to receive suggestions for improvements to ProB or the documentation.
- Where can I get an up-to-date FAQ?

  Please check on the official ProB web page (http://www.ecs.soton.ac.uk/~mal/systems-/prob.html) . Updates will be posted there. If you subscribe to the ProB mail-list you will be notified when updates become available.
- Windows: Do I have to install ProB to C:\ProB?

  No. You can install ProB wherever you like. Note however that it is a good idea to avoid placing ProB or B machines in directories whose complete path contain spaces.
- Why is the installation manual so large / so small?

  The documentation is available in multiple editions, ranging from large and verbose to half a page. You probably have the wrong edition for your needs. Please read the first section of this document.

- The Postscript manuals won't print.

  This is likely to be due to the large colour images contained in the documentation. If you are using Windows, try to print from the Acrobat version. If we receive enough requests we will create monochrome versions of the documentation.

- Some of the figures int the html version of the manual look strange or are grey.

  This is by-produce of latex2html. We are attempting to resolve this issue.

- Why aren't there installation instructions for operating system / machine architecture XYZ.

  There are limitations on which distributions of ProB we can produce (either Sicstus Prolog isn't available for that platform or we do not have access to the relevant hardware). We won't write installation instructions for third party software if ProB cannot be compiled for that workstation or operating system.

- How can I keep my version of ProB up-to-date?

  Launch ProB and select "Check for Updates" in the *About* menu.

- The Adobe Acrobat version of the documentation looks awful on Macintosh OS X.

  This is a problem with the latex pdf generator. Convert the postscript versions of the documents using the tools that come with OS X.

1.2.2 Student Edition CDROM Frequently Asked Questions

- Java VM installation - Broken links from "Local Copies" in Installation Manual

  If you are using the Southampton University ECS distribution of ProB we have attempted to put all the software you will need onto CD. However, some URLs do not translate well to local file-systems (such as on the CDROM). Invariably, the software *will* be on the CDROM in the directory referred to by the "local copy" reference, but may contain characters in the file name that cause your browser to become confused (for example question marks and tildes).

  Currently, this problem only affects the Java installation programs from Sun. You will find the them in the cached/java.sun.com/webapps/ directory of the CDROM. Note that MAC (OS X) users should use the software update facility in preference.

- Windows Java VM Installer - Should I choose the on-line or offline installer

  Preferably use the on-line installer that is available from http://java.sun.com. (Go to the Java VM Link on the right hand side. Select "Get it Now".)

  If you intend to download the installer for later use or are using the CDROM use the offline installer. The offline version is in the directory cached/java.sun.com/webapps/download on the CDROM.

1.2.3 Installing ProB on Linux

Quick Install

Download that gzipped tarball from `http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/ProB_Linux.tar.gz` . Decompress and unpack the tarball into the desired target installation directory (files in the tar are in ProB/). ProB can only be started when the current directory is the one created by the tar (i.e. ProB). Start ProB by running `ProBLinux.sh`. On first use, run the self check command from the debug menu.

Sources of ProB for Linux

ProB may be obtained from the Declarative Systems and Software Engineering Group of the School of Electronics and Computer Science, University of Southampton, UK (http://www.-dsse.ecs.soton.ac.uk).

The official homepage of ProB is at `http://www.ecs.soton.ac.uk/~mal/systems/prob.html` .

At the current time, the installation binary is located at

`http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/ProB_Linux.tar.gz`

- Installation Guides and the User Manual can be obtained from the ProB homepage
- A frequently asked questions document (FAQ) is available here:

  `http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/FAQ.txt`

Detailed guide to the installation process

1. Download the installation binary from `http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/ProB_Linux.tar.gz`
2. Change to the directory into which you want to install ProB. Decompress and extract the contents of the tar. For example,

   ```
   mkdir -p ~/bin/Linux; cd ~/bin/Linux; gzip -dc ProBLinux.tar.gz | tar xvf -
   ```

3. To start ProB on Linux, locate and run the extracted file `ProBLinux.sh`. *Your current directory must be the same as the directory in which this file resides. Appending the extracted ProB directory to your PATH will not work.*
4. To simplify invocation of ProB, the simplest solution is to add an alias to your .login or .cshrc. For example, add the following to ∼/.login (replace the path as appropriate):

   ```
   alias ProB 'cd <directory_containing_ProBLinux.sh> ; ./ProBLinux.sh'
   ```

   For example,

   ```
   alias ProB 'cd ~/bin/Linux/ProB/; ./ProBLinux.sh'
   ```

5. To check that ProB has been successfully installed, run the Perform Self Check option from the Debug menu. A popup will appear stating whether the self-check has passed or not. In the unlikely event that the self-check fails, consult the section on "Trouble Shooting" in the ProB *User Manual.*

1.3 Keeping ProB up-to-date

ProB is regularly updated[1]. (See the release notes in the *User Manual* to get some idea of the frequency of update releases.) If you would like to be notified of new updates please register with the ProB mailing list.

To determine if your installation of ProB is out of date, use About→Check for Updates. A pop-up will state if a more recent release of ProB is available.

A more efficient method of updating ProB came into being with version 1.0.6. Therefore if you are *using* ProB version 1.0.5 or earlier you will need to perform a fresh installation of ProB. If you are using ProB V1.0.6 or later you only need to download a replacement binary file (`ProBSolaris.sh` or `ProBLinux.sh` or `ProBMac.sh` or `ProBWin.exe` as appropriate).

Fresh Install If you do not want to risk losing change from the preference defaults, please make a backup of the file `ProB_Preferences.pl` before removing / over-writing your old installation. Simply copy this file back to directory into which the binary (`ProBSolaris.sh` or `ProBLinux.sh` or `ProBMac.sh` or `ProBWin.exe` as appropriate) resides after (re)installing. Alternatively install the new version of ProB to another directory.

Windows users can run the new installer and answer 'yes' to the prompt for over-writing files. The windows installer / un-packer should automatically attempt to re-install ProB into the directory where the existing version is installed.

UNIX (Solaris, Linux and Mac OS X) users may simply decompress and untar the installation `.tar.gz` over their existing installation.

Over-writing ProB Binary Users with version 1.0.6 or later should obtain the appropriate file (i.e. `ProBSolaris.sh, ProBLinux.sh, ProBMac, ProBWin.exe or ProB.sav` as appropriate) from `http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/Updates/` and over-write their existing binary with the new copy. ProB will need to be restarted.

Solaris, Linux and Mac OS X users with `wget` installed need only change to the installation directory of ProB and run

```
wget http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/Updates/XXX
```

where `XXXX` is either `ProBSolaris.sh` or `ProBLinux.sh` or `ProBMac.sh` as appropriate. You will need to change the permissions on the downloaded file to allow execution (e.g. using `chmod u+x`).

Important Notes on Upgrading ProB

1. Updates are the latest public releases. Older versions of updates and installation binaries / tars are not currently available. Unless you retain the previous installation / update files in separate directories/locations, you will not be able to down-grade ProB to a previous version. However, if you would like a previous release of ProB please contact us.

[1] Note that you don't *need* to update ProB. Check the release file at `http://www.ecs.soton.ac.uk/~mal/systems/ProB_Download/Updates/RELEASE_HISTORY.txt` to see the recent changes.

1.4 Installing GraphViz

GraphViz is a set of graph drawing tools. We *strongly* recommend that you install them. ProB is much easier to use with visualisation functionality than without.

1.4.1 Frequently Asked Questions

- Do I have to install GraphViz?

  No. You can use ProB without visualisation. However, if you attempt to use the commands in the animation/visualisation menu without GraphViz installed, you may cause an error in ProB.

- Should I use *dotty* or a PostScript viewer?

  There is no simple answer to this question. See the *Graphical Viewer Preference* sub-section in the section on *Beginner Mode Settings* of the User Manual for more information.

- My state spaces are large and both *dotty* and PostScript viewers are cumbersome for visualisation.

  We are working on an alternative viewer for large state spaces.

- I'm using Unix and I cannot access the menus in *dotty*.

  This almost certainly means you have num-lock on.

- The graphs that dotty or the PostScript viewer generate do not look like those in the manual.

  Firstly, *dotty* and PostScript viewing support different shapes, colours and viewing options. Secondly, the shapes, colours, text on nodes, visibility, and colour-fill characteristics used during viewing are all user defined. Most likely, you have settings different from those used during the generation of the manual. See the *Typical Settings* sub-section of the *Preferences Settings* section of the User Manual for more information.

- On Unix, dotty complains that it cannot find lefty.

  Unlike *dot* and *lefty*, *dotty* is a script. If *dotty* cannot find *lefty* You have to set the environmental variable `LEFTYPATH` to the directory that contains the file `dotty.lefty`. See the detailed installation notes for GraphViz in this document.

1.4.2 Installing GraphViz on Linux (RPM)

Quick installation

Download `http://www.graphviz.org/pub/graphviz/ARCHIVE/graphviz-1.10-1.i386.rpm` .
// As root do `rpm -Uvh graphviz-1.10-1.i386.rpm`

Sources for Linux GraphViz (RPM variant)

There are no restrictions on the version of GraphViz used by ProB. However, the installed version must provide command line versions of `dot`, `dotty` and `lefty`.

Note that some Linux distributions already include GraphViz. The GraphViz utilities `dot`, `dotty` and `lefty` must *all* be on your path. To determine if GraphViz is installed (using RPM) run `rpm -qa | grep -i graphviz`. Alternatively, use either which (`which dot ; which dotty ; which lefty`) or `locate dot | grep bin ...` to determine if they are already installed.

GraphViz may be obtained from the official AT&T web-site or from an alternative source. The official web-site `http://www.research.att.com/sw/tools/graphviz` . Note that to perform an installation using RPM you need root access.

If you do not with to install using RPM or do not have permissions to do so see section on general Unix installation for instructions.

The remainder of this section assumes you are installing the official GraphViz distribution from AT&T and that you have permission to use rpm to install GraphViz.

At the current time, the installation binary is located at

`http://www.graphviz.org/pub/graphviz/ARCHIVE/graphviz-1.10-1.i386.rpm`

- An installation manual is available from AT&T:

  `http://www.research.att.com/sw/tools/graphviz/download.html`

- A frequently asked questions document (FAQ) from AT&T:

  `http://www.research.att.com/sw/tools/graphviz/doc/gvizfaq.html`

- An official user manual:

  `http://www.research.att.com/sw/tools/graphviz/dottyguide.pdf`

Detailed guide to the installation process

The process of installing GraphViz for Linux using RPM is trivial (unless you have unfulfilled dependencies):

1. Download the installation binary from
   `http://www.graphviz.org/pub/graphviz/ARCHIVE/graphviz-1.10-1.i386.rpm` .
2. Install the package using the update options (GraphViz is included in some distributions of Linux):
   `rpm -Uvh graphviz-1.10-1.i386.rpm`.
3. The GraphViz (i386) binaries are placed by default into `/usr/bin`. Either logout/login or rehash your path.
4. Check that the `dot`, `dotty` and `lefty` utilities are now on your path and are executable. `dot` and `lefty` should be binaries (i386 ELF 32-bit LSB non-stripped executables) and `dotty` is a Bourne shell script.

1.4.3 Installing GraphViz on Linux (Debian)

Quick installation

Download and install the Debian package from `http://ftp.uk.debian.org/debian/pool/non-free/g/graphviz/graphviz_1.10.20030915.0415-2_i386.deb` using dpkg -i.

Sources for Linux (Debian variant)

There are no restrictions on the version of GraphViz used by ProB. However, the installed version must provide command line versions of `dot`, `dotty` and `lefty` and these must be on your path.

GraphViz may be obtained either from the official AT&T web-site or using apt-get. The official web-site `http://www.research.att.com/sw/tools/graphviz` .

The remainder of this section assumes you are installing the (.deb) GraphViz distribution from AT&T.

At the current time, the installation binary is located at

`http://ftp.uk.debian.org/debian/pool/non-free/g/graphviz/graphviz_1.10.20030915.0415-2_i386.deb`

- An installation guide from AT&T:

  `http://www.research.att.com/sw/tools/graphviz/download.html`

- A frequently asked questions document (FAQ) from AT&T:

  `http://www.research.att.com/sw/tools/graphviz/doc/gvizfaq.html`

- An official user manual:

  `http://www.research.att.com/sw/tools/graphviz/dottyguide.pdf`

1.5 Installing a Java Run-time Environment

1.5.1 Frequently asked questions

- Do I need the Java Run-time Environment?

  If you wish to edit the provided sample machines or create / compile your own, yes. ProB will run *without* a Java distribution installed, but you will only be able to use the sample machines we have pre-compiled. If you edit them they will cease to load.

- Can I use an alternative Java VM or SDK?

  Yes. However, if ProB fails to work correctly because of differences between the Sun Java VM and your particular installation, we may not be able to help resolve the problem.

1.5.2 Installing the Java Run-time Environment on Linux (RPM)

Quick Installation

Download the self-extracting install script from `http://java.sun.com/webapps/download/AutoDL?BundleId=9561` . Run the script to view / agree to the Sun Binary Code Licence Agreement and create the RPM (`j2re-1_4_2_03-linux-i586.rpm`). As root, install with `rpm -Uvh j2re-1_4_2_03-linux-i586.rpm`. Append `/usr/java/j2re1.4.2_03/bin` and `/usr/java/j2re1.4.2_03/man/` to `PATH` and `MANPATH` respectively.

Sources for Java RTE for Linux (RPM variant)

The Sun Java Run-time Environment can be obtained from the official Sun Java web-site `http://java.sun.com` . The remainder of this section assumes you are installing the Sun version of the Java Run-time Environment.

At the current time, the installation binary is located at

`http://java.sun.com/webapps/download/AutoDL?BundleId=9561`

- An installation guide specifically for windows:

  `http://java.com/en/download/help/linux_install.jsp`

- A frequently asked questions document (FAQ) from:

  `http://java.com/en/download/faq/index.jsp`

- An official user manual:

  has not yet been located

If you do not have permission to install from RPM, obtain the non-RPM installation for Linux from Sun (see 1.5.3.). Alternatively, install the Java SDK which can be installed into an arbitrary directory.

Detailed guide to the installation process

1. Download the installation script from
   `http://java.sun.com/webapps/download/AutoDL?BundleId=9561`
2. The file downloaded is a Bourne script. Use sh to invoke it:
   sh *filename* For example, if you downloaded from the www and saved the file as XYZ.sh

   ```
   sh ./XYZ.sh
   ```

3. You will be presented with the Sun Binary Code Licence agreement. To proceed with the installation you must agree to the terms laid out. (Scroll down with space, and enter "yes" or "no").

   The installer will then unpack the distribution resulting in an RPM package file.

4. Install the RPM using the upgrade options:

   ```
   rpm -Uvh j2re-1_4_2_03-linux-i586.rpm
   ```

   The RPM will install the files into `/usr/java/j2re1.4.2_03/`.

5. You will need to add `/usr/java/j2re1.4.2_03/bin` to your `PATH` and also append `/usr/java/j2re1.4.2_03/man` to your `MANPATH`.

   Alternatively, if your default shell it tcsh or csh, copy and paste the following into a file in your file-space (e.g. ~/bin/Java_RTE.csh):

```
#!/bin/csh

if ($?!MANPATH) then
setenv MANPATH ${MANPATH}:/usr/java/j2re1.4.2_03/man/
else
setenv MANPATH /usr/java/j2re1.4.2_03/man/
end

setenv PATH ${PATH}:/usr/java/j2re1.4.2_03/bin
```

6. Add the following entry to ~/.chsrc:

```
source ~/bin/Java_RTE.csh
```

1.5.3 Installing the Java Run-time Environment on Linux (Non-RPM)

Quick Installation

Download the self-extracting install script from `http://java.sun.com/webapps/download/AutoDL?BundleId=9562` . Make and/or change into the desired installation directory root. Run the script to view / agree to the Sun Binary Code Licence Agreement and extract the installation to `./j2re1.4.2_03`. Append *Install_Directory*`/j2re1.4.2_03/bin` and *Install_Directory*`/j2re1.4.2_03/man` to `PATH` and `MANPATH` respectively.

Sources for Java Run-time Environment for Linux (non-rpm variant)

The Sun Java Run-time Environment can be obtained from the official Sun Java web-site `http://java.sun.com` . The remainder of this section assumes you are installing the Sun version of the Java Run-time Environment.

At the current time, the installation self-extracting script is located at

`http://java.sun.com/webapps/download/AutoDL?BundleId=9562`

- The installation guide:

  `http://java.com/en/download/help/linux_install.jsp`

- A frequently asked questions document (FAQ):

  `http://java.com/en/download/faq/index.jsp`

- An official user manual:

  has not yet been located

Detailed installation instructions

The non-rpm distribution of the Java Run-time Environment from Sun is self-extracting script. It extracts into `./j2re1.4.2_03/` in the directory in which the installation script is invoked. This installation method is suitable for users without permissions to use RPM.

1. Download the self-extracting Bourne shell script from `http://java.sun.com/webapps/download/AutoDL?BundleId=9562`
2. Make and/or change directory to the desired installation location (e.g. `~/bin/LINUX/`) and invoke the script using `sh`. For example, if you saved the download as `XYZ.sh` in `~/`:

   ```
   mkdir -p ~/bin/LINUX/ ; cd ~/bin/LINUX/ ; sh ~/XYZ.sh
   ```

   You will be presented with the Sun Binary Code Licence agreement. To proceed you must agree to the conditions (use space to page through the licence and enter "yes" when prompted.)
3. The install script will now automatically extract to the current directory in `./j2re1.4.2_03`. (For example, `~/bin/LINUX/j2re1.4.2_03`).
4. You must update your `PATH` and `MANPATH` settings with `j2re1.4.2_03/bin` and `j2re1.4.2_03/man` respectively.

   If your default shell is csh or tcsh, copy and paste the following into a file in your file-space (e.g. `~/bin/Java_RTE.csh`) and modify the definition of `Java_RTE_HOME` to match the directory in which you invoked the install script:

   ```
   #!/bin/csh
   setenv Java_RTE_HOME ~/bin/LINUX/
   if ($?!MANPATH) then
   setenv MANPATH ${MANPATH}:${Java_RTE_HOME}/j2re1.4.2_03/man/
   ```

```
else
setenv MANPATH ${Java_RTE_HOME}/j2re1.4.2_03/man/
end
setenv PATH ${PATH}:${Java_RTE_HOME}/j2re1.4.2_03/bin
```

5. Add the following entry to ~/.cshrc:

```
source ~/bin/Java_RTE.csh
```

1.6 Installing TclTk

1.6.1 Frequently Asked Questions

- Do I need to install Tcl/Tk?

  At present, you cannot use ProB without Tcl/Tk installed. However, a version of ProB with a Java interface is currently being written. If you subscribe to the ProB users email list, you will be notified when it becomes available.

- Can I use a different version or distribution of Tcl/Tk?

  Maybe. The only limitations we know of at present are those inherent to Sicstus Prolog. This means that windows users require version 8.3 of Tcl/Tk. Linux / Unix users should use at least version 8.3. Sicstus recommends 8.4 for Unix environments. ProB is developed using both Active and Aqua Tcl.

1.6.2 Installing Active Tcl/Tk for Linux (Non-RPM)

Quick Installation

Download the gzipped tarball from `http://downloads.activestate.com/ActiveTcl/Linux/8.4.5/ActiveTcl8.4.5.0-linux-ix86-83070.tar.gz` . Decompress and extract to a temporary directory. Execute the script `Install.sh` in the ActiveTcl directory. Install using defaults. Update `PATH` settings (and possibly `LD_LIBRARY_PATH`).

Sources for ActiveTcl for Linux

Linux users currently require Tcl 8.3 or greater. Note that almost all Linux distributions include a Tcl/Tk distribution:

RedHat 9.0 tcl-8.3.5-88.i386.rpm and tk-8.3.5-88.i386.rpm

Debian Woody stable packages tcl8.3 tk8.3 // unstable packages: tcl8.4 and tk8.4

If Tcl/Tk is not installed, Active Tcl/Tk is recommended (`http://www.activestate.com/Products/ActiveTcl`).

At the current time, the installation binary is located at is at `http://downloads.activestate.com/ActiveTcl/Linux/8.4.5/ActiveTcl8.4.5.0-linux-ix86-83070.tar.gz` .

- An installation guide specifically for Linux from Active:
  `http://aspn.activestate.com/ASPN/docs/ActiveTcl/at.install.html`
- A frequently asked questions document (FAQ) from Active:
  `http://www.activestate.com/Products/Download/ShowSysReqs.plex?req=ActiveTcl`
- Official user manual for Active Tcl:
  `http://downloads.activestate.com/ActiveTcl/html/8.4.5/ActiveTcl8.4.5.0-html.tar.gz`)

Detailed guide to the installation process

The process of installing Active Tcl for Linux is straight forward if you do not change the default installation location (i.e. where the Active Tcl installer places its files in the file system). Because Tcl is integral to many Linux distributions, we do not recommend that you replace versions installed during the installation of your Linux workstation. Instead install ActiveTcl to a directory *not* on the default path and adjust `PATH` and `MANPATH` as required (detailed below). Note that you may also have to append the `lib` directory to `LD_LIBRARY_PATH` for ProB usage.

1. Download the installation binary `http://downloads.activestate.com/ActiveTcl/Linux/8.4.5/ActiveTcl8.4.5.0-linux-ix86-83070.tar.gz`
2. Create a temporary directory, uncompress and unpack the gzipped tarball. For example, if you downloaded the installation file into ~/:

   ```
   mkdir ~/temptcl ;
   gzip -dc ~/ActiveTcl8.4.5-linux-ix86-83070.tar.gz | tar xvf -
   ```

3. Change into the directory created during the extract process (e.g. `cd ActiveTcl8.4.5.0-linux-ix86/`) and invoke the installation script provided by ActiveTcl (`install.sh`). The graphical installer should now start.
4. Select *Proceed* to continue (Figure 1.1).
5. To continue with the installation, read and accept the Licence Agreement then select *Next* (Figure 1.2.)

6. Choose the base directory for the installation of ActiveTcl. (The default is `/usr/local`.) If you do not have permission to install into `/usr/local/` ActiveTcl can be installed successfully in local file-space (e.g. `~/bin/`). (Figure 1.3.)
7. Specify base directory for installation of TclTk demonstration programs. (Default should be okay.) (Figure 1.4.)
8. Specify Run-time directory. Unless you have a very good reason, do not change this setting from the one suggested by the installer. Select *Next* to proceed. (Figure 1.5.)
9. Select *Next*. Installation should now complete by itself. Note that if you have installed ActiveTcl to a directory not on the default path make note of the settings changes it presents when setup completes. This information will allow you to update your PATH (and other settings). (Figure 1.6.)
10. **Note: if ProB reports that it cannot find the Tcl libraries but they *are* in the `lib` directory of the Tcl installation, you will need to append this directory to `LD_LIBRARY_PATH`. For example, setenv LD_LIBRARY_PATH ${LD_LIBRARY_PATH}:~/bin/ActiveTcl/lib.**

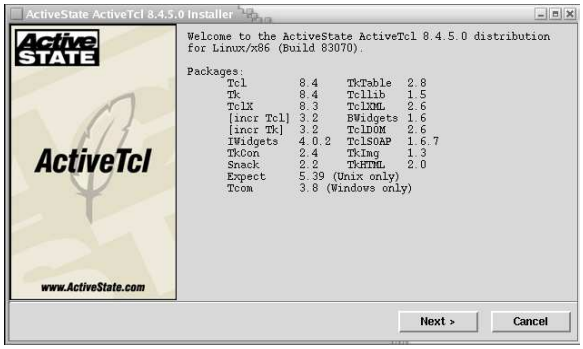

Figure 1.1: Proceed with Installation

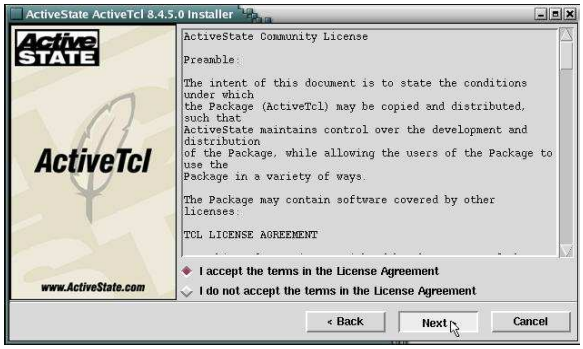
ActiveState ActiveTcl 8.4.5.0 Installer
ActiveState Community License
Preamble:
The intent of this document is to state the conditions under which
the Package (ActiveTcl) may be copied and distributed, such that
ActiveState maintains control over the development and distribution
of the Package, while allowing the users of the Package to use the
Package in a variety of ways.
The Package may contain software covered by other licenses.
TCL LICENSE AGREEMENT
I accept the terms in the License Agreement
I do not accept the terms in the License Agreement
ActiveTcl
www.ActiveState.com
< Back
Next
Cancel

Figure 1.2: Accept Licence (or decline to exit).

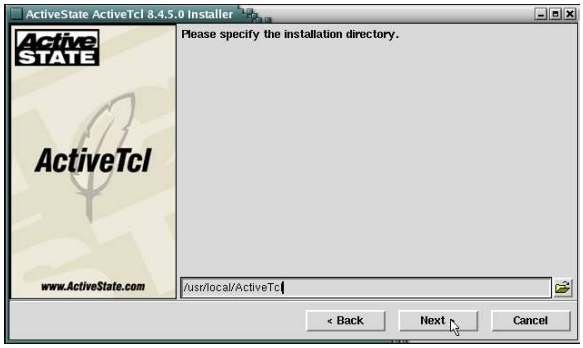

Figure 1.3: Specify base directory for installation.

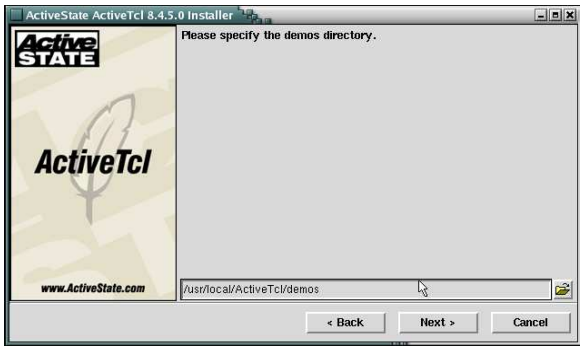

Figure 1.4: Specify base directory for installation of TclTk demonstrations

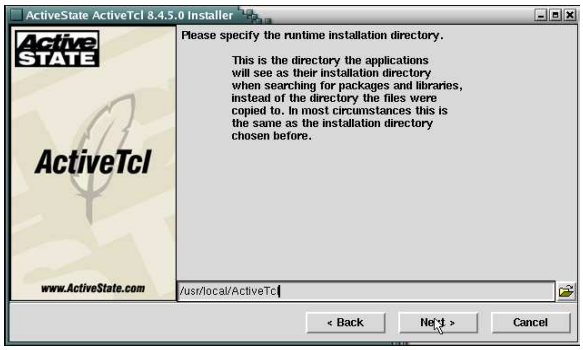
ActiveState ActiveTcl 8.4.5.0 Installer
Please specify the runtime installation directory.
This is the directory the applications will see as their installation directory when searching for packages and libraries, instead of the directory the files were copied to. In most circumstances this is the same as the installation directory chosen before.
ActiveTcl
www.ActiveState.com
/usr/local/ActiveTcl
< Back
Next >
Cancel

Figure 1.5: Specify Run-time directory (do not change)

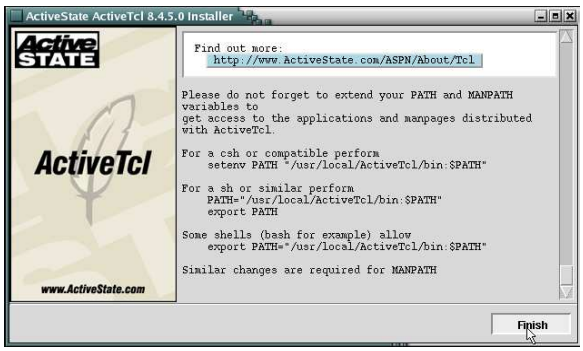
ActiveState ActiveTcl 8.4.5.0 Installer
Find out more:
http://www.ActiveState.com/ASPN/About/Tcl
Please do not forget to extend your PATH and MANPATH variables to
get access to the applications and manpages distributed with ActiveTcl.
For a csh or compatible perform
setenv PATH "/usr/local/ActiveTcl/bin:$PATH"
For a sh or similar perform
PATH="/usr/local/ActiveTcl/bin:$PATH"
export PATH
Some shells (bash for example) allow
export PATH="/usr/local/ActiveTcl/bin:$PATH"
Similar changes are required for MANPATH
ActiveTcl
www.ActiveState.com
Finish

Figure 1.6: Installation Completed (including path update information if necessary).